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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,292	11/24/2003	Robert A. Cordery	F-714	4123
<div>Pitney Bowes Inc. Intellectual Property & Technology Law Department 35 Waterview Drive P.O. Box 3000 Shelton, CT 06484</div>				
			EXAMINER ZHENG, JACKY X	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/720,292	Applicant(s) CORDERY ET AL.	
	Examiner Jacky X. Zheng	Art Unit 2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on November 23, 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on November 24, 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>11/24/2003</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This is the initial office action based on the application filed on November 24, 2003.
2. The information disclosure statement (IDS) submitted on November 24, 2003 was filed on the mailing date of the application on November 24, 2003. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Specification

3. The disclosure is objected to because of the following informalities: Paragraph [0009] of Specification, "a postal indicia" should be replaced with "a postal indicium" or "postal indicia". Applicant is reminded for verifying the remaining of the disclosure for such minor informalities. Appropriate correction is required.

Claim Objections

4. **Claims 8 and 18** are objected to because of the following informalities: the claims recite the limitation of "a postal indicia" and should be replaced with "a postal indicium" or "postal indicia". Appropriate correction is required.

Double Patenting

5. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re*

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Goodman, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

6. **Claims 1** is provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over **claims 1, 8-9, 11 and 18** of copending **Application No. 10/720,664** (Corresponding publication of this application, **U.S. Pub. No. 2005/0114668**, hereinafter refers as “**Haas et al.**”). Although the conflicting claims are not *completely* identical, they are not patentably distinct from each other because the subject matter claimed in the instant application (claim 1 specifically) is claimed in the co-pending application, **Haas et al.**. In details, the scopes of the claims 1, 11, 8-9 and 11 of **Haas et al.** contain *substantially* every elements of the independent claim 1 of instant application. A detailed comparison of the claims languages presented in instant application and the co-pending application is illustrated in the table below.

This is a **provisional** obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims in Instant Examined Application	Claims in <u>Haas et al.</u> (Co-pending Application)
<p>Claim 1 - A method of determining whether a printed-image-under-examination (PIUE) is a copy of an original printed image, the method comprising: (a) scanning the PIUE to generate scanned image data, the scanned image data comprising pixel data, the pixel data comprising gray scale values and representing the PIUE as a set of scanning pixels; (b) forming a plurality of data blocks from the scanned image data, each data block consisting of pixel data which corresponds to a respective region of the PIUE; (c) transforming the pixel data in at least some of the data blocks to obtain transform domain data; (d) applying a watermark detecting operation to the transform domain data for respective ones of the data blocks to generate recovered watermark data; and (e) determining a correlation between the recovered watermark data for at least some of the data blocks and brightness levels for said data blocks.</p>	<p>Claim 1 - A method of watermarking an image to facilitate detection of copying of the image, the method comprising: (a) providing image data that represents an image, the image data comprising pixel data that represents respective gray-scale values of pixels of the image; (b) forming a plurality of data blocks from the image data, each data block consisting of pixel data which corresponds to a respective region of the image; (c) determining for each of the data blocks an average value of the pixel data in the data block; (d) determining for each of the data blocks a target for the average value of the pixel data in the data block; and (e) adjusting respective values of at least some of the pixel data in each of at least some of the data blocks to shift the average value of the pixel data in the respective data block toward the target for the respective data block.</p> <p style="text-align: center;">OR</p> <p>Claim 11 - A method of determining whether a printed-image-under-examination (PIUE) is a copy of an original printed image, the method comprising: (a) scanning the PIUE to generate scanned image data, the scanned image data comprising pixel data, the pixel data comprising gray scale values and representing the PIUE as a set of scanning pixels; (b) forming a plurality of data blocks from the scanned image data, each data block consisting of pixel data which corresponds to a respective region of the PIUE; (c) determining for each of the data blocks an average value of the pixel data in the data block; (d) determining for each of the data blocks an index value based on the average value of the pixel data in the data block; and (e) for each data block, calculating a difference between the index value for the data block and a value that represents a target value for a corresponding block of pixel data that was used to generate the original printed image.</p> <p style="text-align: center;">OR</p> <p>Claim 18 - A method of determining whether a printed-image-under-examination (PIUE) is a copy of an original printed image, the method comprising: (a) scanning the PIUE to generate scanned image data, the scanned image data comprising pixel data, the pixel data comprising gray scale values and representing the PIUE as a set of scanning pixels; (b) forming a plurality of data blocks from the scanned image data, each data block consisting of pixel data which corresponds to a respective region of the PIUE; (c) determining for each of the data blocks an average value of the pixel data in the data block; (d) determining for each of the data blocks an index value based on the average value of the pixel data in the data block; and (e) for each data block, calculating a difference between the index value for the data block and an expected value of the index value.</p> <p style="text-align: center;">AND</p> <p>Claim 8 - The method according to claim 1, further comprising: (f) printing a printed image on the basis of the image data after adjustment according to step (e).</p> <p>Claim 9 - The method according to claim 8, wherein the image data is subjected to a transformation that is performed after step (e) and before step (f).</p>

7. Claims 1, 3, 8-10, 13, 18-19 and 21-22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-3 and 8-11 of copending Application No. 10/929,588 (Corresponding publication of this application, U.S.

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Pub. No. 2006/045306, hereinafter refers as “**Cordery et al.**”). Although the conflicting claims are not *completely* identical, they are not patentably distinct from each other because the subject matter claimed in the instant application (claims 1, 3, 8-10, 13, 18-19 and 21-22) is claimed in the co-pending application, **Cordery et al.**. In details, the scopes of the claims 1-3 and 9-11 of **Cordery et al.** contain *substantially* every elements of the independent claim 1 of instant application. A detailed comparison of the claims languages

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claims in Instant Examined Application	Claims in Cordery et al. (Co-pending Application)
Claim 1 - A method of determining whether a printed-image-under-examination (PIUE) is a copy of an original printed image, the method comprising: (a) scanning the PIUE to generate scanned image data, the scanned image data comprising pixel data, the pixel data comprising gray scale values and representing the PIUE as a set of scanning pixels; (b) forming a plurality of data blocks from the scanned image data, each data block consisting of pixel data which corresponds to a respective region of the PIUE; (c) transforming the pixel data in at least some of the data blocks to obtain transform domain data; (d) applying a watermark detecting operation to the transform domain data for respective ones of the data blocks to generate recovered watermark data; and (e) determining a correlation between the recovered watermark data for at least some of the data blocks and brightness levels for said data blocks.	Claim 8 - A method of determining whether a printed-image-under-examination (PIUE) is authentic, the PIUE including a watermark formed of a plurality of wavepackets, the method comprising: (a) scanning the PIUE to generate scanned image data comprising pixel data, the pixel data comprising gray scale values and representing the PIUE as a set of scanning pixels; (b) forming a plurality of data blocks from the scanned image data, each data block consisting of pixel data which corresponds to a respective region of the PIUE; (c) transforming the pixel data in at least some of the data blocks to obtain transform domain data; (d) applying a watermark detecting operation to the transform domain data for respective ones of the data blocks to detect at least one of (i) variations in intensity among the wavepackets, and (ii) variations in phase among the wavepackets; and (e) analyzing the detected variations in intensity and/or variations in phase to detect a message encoded with said variations in intensity and/or variations in phase.
Claim 3 - The method according to claim 1, wherein step (c) includes applying at least one of a Fourier transform, a fast Fourier transform, a discrete cosine transform (DCT) and a wavelet transform to the pixel data in the at least some of the data blocks to obtain the transform domain data.	Claim 9 - The method according to claim 8, wherein step (c) includes applying at least one of a Fourier transform, a fast Fourier transform, a discrete cosine transform (DCT) and a wavelet transform to the pixel data in the at least some of the data blocks to obtain the transform domain data.
Claim 8 - The method according to claim 1, wherein the PIUE is part of a postal indicia.	Claim 10 - The method according to claim 8, wherein the PIUE is part of a postal indicium.
Claim 9 - The method according to claim 1, wherein the regions of the PIUE to which the data blocks correspond are at least partially overlapping with each other.	Claim 11 - The method according to claim 8, wherein the regions of the PIUE to which the data blocks correspond are at least partially overlapping with each other.
Claim 10 - A method of determining whether a printed-image-under-examination (PIUE) is a copy of an original printed image, the original printed image including a watermark applied to the image using a plurality of wave vectors, the method comprising: (a) scanning the PIUE to generate scanned image data, the scanned image data comprising pixel data, the pixel data comprising gray scale values and representing the PIUE as a set of scanning pixels; (b) forming a plurality of data blocks from the scanned image data, each data block consisting of pixel data which corresponds to a respective region of the PIUE; (c) transforming the pixel data in at least some of the data blocks to obtain transform domain data; (d) applying a watermark detecting operation to the transform domain data for respective ones of the data blocks to generate recovered watermark data; and (e) determining at least one of (i) a correlation between the recovered	Claim 8 - A method of determining whether a printed-image-under-examination (PIUE) is authentic, the PIUE including a watermark formed of a plurality of wavepackets, the method comprising: (a) scanning the PIUE to generate scanned image data comprising pixel data, the pixel data comprising gray scale values and representing the PIUE as a set of scanning pixels; (b) forming a plurality of data blocks from the scanned image data, each data block consisting of pixel data which corresponds to a respective region of the PIUE; (c) transforming the pixel data in at least some of the data blocks to obtain transform domain data; (d) applying a watermark detecting operation to the transform domain data for respective ones of the data blocks to detect at least one of (i) variations in intensity among the wavepackets, and (ii) variations in phase among the wavepackets; and (e) analyzing the detected variations in intensity and/or variations in phase to detect a

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watermark data for at least some of the data blocks and brightness levels for said data blocks, and (ii) a correlation between the recovered watermark data and the wave vectors.	message encoded with said variations in intensity and/or variations in phase.
Claim 13 - The method according to claim 10, wherein step (c) includes applying at least one of a Fourier transform, a fast Fourier transform, a discrete cosine transform (DCT) and a wavelet transform to the pixel data in the at least some of the data blocks to obtain the transform domain data.	Claim 9 - The method according to claim 8, wherein step (c) includes applying at least one of a Fourier transform, a fast Fourier transform, a discrete cosine transform (DCT) and a wavelet transform to the pixel data in the at least some of the data blocks to obtain the transform domain data.
Claim 18 - The method according to claim 10, wherein the PIUE is part of a postal indicia.	Claim 10 - The method according to claim 8, wherein the PIUE is part of a postal indicium.
Claim 19 - The method according to claim 10, wherein the regions of the PIUE to which the data blocks correspond are at least partially overlapping with each other.	Claim 11 - The method according to claim 8, wherein the regions of the PIUE to which the data blocks correspond are at least partially overlapping with each other.
Claim 21 - The method according to claim 20, further comprising: (f) transforming pixel values of the combined image data.	Claim 2 - The method according to claim 1, further comprising: (g) transforming pixel values of the combined image data.
Claim 22 - The method according to claim 21, further comprising: (g) printing an image using the transformed pixel values resulting from step (f).	Claim 3 - The method according to claim 2, further comprising: (h) printing an image using the transformed pixel values resulting from step (g).

Claim Rejections - 35 USC § 112

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. **Claims 1-19 and 21-22** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

10. **Claims 1 and 10** recite the limitations of “transforming the pixel data” and “transform domain data” in step “(c)” of both claims. Such limitations have not been *explicitly* depicted with sufficient descriptions in the instant claim, and it is unclear which types of transforming process and/or kinds of image attributes that the transformation process regards to in consideration of claim language in the instant claims. The scopes of such limitations are unable to be determined in view abovementioned reasons. Further clarification is required. This issue also affects the dependent claims 2-9 and 11-19.

11. **Claim 21** recites the limitation of “transforming pixel values” in step “(f)”. Such a limitation has not been *explicitly* depicted with sufficient descriptions in the instant claim, and it

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is unclear which types of transforming process and/or kinds of image attributes that the transformation process regards to in consideration of claim language in instant claim. The scope of such a limitation is unable to be determined in view abovementioned reasons. Further clarification is required. This issue also affects the dependent claim 22.

12. Claims 2 and 11 recite the limitations of “a strength of the recovered watermark data”. Such limitations have not been *explicitly* depicted with sufficient descriptions in the instant claim. The scopes of such limitations are unable to be determined, and further clarification or rephrasing of such limitations is required.

13. The phrase “negatively correlated” in claims 2 and 11 is considered to be relative phraseology which renders the claim indefinite. The phrase “negatively correlated” is not defined by the claim, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

14. The term “partially” in claims 9 and 19 is considered to be relative term which renders the claim indefinite. The term “partially” is not defined by the claim, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

15. The phrase “positively correlated” in claim 12 is considered to be relative phraseology which renders the claim indefinite. The phrase “negatively correlated” is not defined by the claim, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claim Rejections - 35 USC § 102

16. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

17. **Claims 1-4, 9-15 and 19-22** are rejected under 35 U.S.C. 102(e) as being anticipated by **Sharma et al. (U.S. Pub. No. 2004/0105569)**.

With regard to claim 1, the claim is drawn to a method of determining whether a printed-image-under-examination (PIUE) is a copy of an original printed image, the method comprising: (a) scanning the PIUE to generate scanned image data, the scanned image data comprising pixel data, the pixel data comprising gray scale values and representing the PIUE as a set of scanning pixels (*See Sharma et al., i.e. Figure 1, Block 100; paragraph [0053], disclose an representation of the original in form of digitized signal*); (b) forming a plurality of data blocks from the scanned image data, each data block consisting of pixel data which corresponds to a respective region of the PIUE (*See Sharma et al., i.e. Figure 6, Blocks 600, 602 & Paragraph [0091], disclose “the detector segments the target image into blocks”*); (c) transforming the pixel data in at least some of the data blocks to obtain transform domain data (*See Sharma et al., i.e. Figure 6, Block 604 & Paragraph [0091] discloses that after segmenting the target image into blocks, and “then performs a 2-dimensional fast Fourier Transform (2D FFT) on several blocks”*); (d) applying a watermark detecting operation to the transform domain data for respective ones of the data blocks to generate recovered watermark data (*See Sharma et al., i.e. Figure 6, Block 606 & Paragraph [0092]*); and (e) determining a correlation between the recovered watermark data for at least some of the data blocks and brightness levels for said data blocks (*See Sharma et al., i.e. Figure 6, Block 610 & Paragraph [0093], “performs a*

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correlation”; additionally, i.e. Paragraphs [0188]-[0206], discloses the usages of “orientation vectors” and extraction of luminance sample data in correlation process; & Paragraph [0081]).

With regard to claim 2, the claim is drawn to the method according to claim 1, further comprising: (f) determining that the PIUE is a copy of the original printed image if a strength of the recovered watermark data is negatively correlated with the brightness levels for said data blocks (See *Sharma et al.*, i.e. Paragraphs [0201], “one figure of merits is the degree of correlation between a known watermark signal attribute and ...” and “another merit is the strength of the watermark signal”).

With regard to claim 3, the claim is drawn to the method according to claim 1, wherein step (c) includes applying at least one of a Fourier transform, a fast Fourier transform, a discrete cosine transform (DCT) and a wavelet transform to the pixel data in the at least some of the data blocks to obtain the transform domain data (see *Sharma et al.*, i.e. Paragraphs [0091] discloses performing a 2-dimensional Fast Fourier Transform to the image blocks; Paragraph [0073] also discloses the commonly known transform types, in both spatial or temporal domain;).

With regard to claims 4 and 5, claim 4 is drawn to the method according to claim 1, wherein the watermark detecting operation includes multiplying the transform domain data with a detecting function; and claim 5 is drawn to the method according to claim 4, wherein the detecting function is e^{ikr} , where k and r are phase space indices applicable to the transform domain data (See *Sharma et al.*, i.e. Paragraph [0056]).

With regard to claims 9, the claim is drawn to the method according to claim 1, wherein the regions of the PIUE to which the data blocks correspond are at least partially overlapping with each other (See *Sharma et al.*, i.e. Paragraph [0145]).

With regard to claims 10-11, 13-15 and 19, the claims are drawn to a method of determining whether a printed-image-under-examination (PIUE) is a copy of an original printed image, the original printed image including a watermark applied to the image using a plurality of wave vectors, the method comprising the *substantially* identical limitations recited in claims 1-5 and 9 *respectively*, and further drawn to using a plurality of wave vectors (*See Sharma et al., i.e. Paragraph [0056] discloses “watermarked signal vector”; Paragraphs [0118]-[0119], disclose “6D and 4D orientation vectors”*).

With regard to claim 12, the claim is drawn to the method according to claim 10, further comprising: (f) determining that the PIUE is a copy of the original printed image if a strength of the recovered watermark data is positively correlated with wavelengths of the wave vectors (*See Sharma et al., i.e. Paragraphs [0201], “one figure of merits is the degree of correlation between a known watermark signal attribute and ...” and “another merit is the strength of the watermark signal”*).

With regard to claim 20, the claim is drawn to a method of applying a watermark to an image, the method comprising; (a) providing image data that represents the image (*see Sharma et al., i.e. Figure 21, block 1306*); (b) providing a message string that includes a plurality of message bits (*see Sharma et al., i.e. Figure 21, block 1300*); (c) arraying the message bits of the message string at points of a D4 lattice, the lattice being formed as a product of a two-dimensional position-domain lattice and a two-dimensional frequency-domain lattice (*see Sharma et al., i.e. Paragraph [0106] discloses two watermark components, “a message component” (in spatial or other transform domain) and “a detection component” (also called the orientation pattern, in frequency domain); Paragraphs [0108]-[0117]*); (d) generating

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watermark image data by convolving each of the message bits with a respective watermark function in accordance with a position of the respective bit in the D4 lattice (*see Sharma et al., i.e. Paragraph [0110] disclose process of "convolution"*); and (e) combining the watermark image data with the image data provided at step (a) to generate combined image data (*see Sharma et al., i.e. Figure 21, block 1318 & Paragraph [0240], disclose the combining of the "host image", "message signal" and "orientation signal"*).

With regard to claim 21, the claim is drawn to the method according to claim 20, further comprising: (f) transforming pixel values of the combined image data (*see Sharma et al., i.e. Figure 21, block 1320 & Paragraph [0240] disclose the limitation of applying "an inverse wavelet transform" (IDWT) to combined signal*).

With regard to claim 22, the claim is drawn to the method according to claim 21, further comprising: (g) printing an image using the transformed pixel values resulting from step (f) (*see Sharma et al., i.e. Paragraphs [0133] discloses the limitations of "intentional tempering", such as "printing and scanning and etc."; Paragraph [0134] discloses a detector designed to recover a watermark from watermarked image after the image has been printed and scanned*).

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

19. **Claims 6-7, 16-17 and 25** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sharma et al.** as applied to claims 1-5, 9-15 and 19-22 above, and further in view of **Murakami (U.S. Patent No. 7,065,237)**.

With regard to claims 6-7 and 16-17, the claims further require the limitations of applying “an envelope function” to the transform domain data, and further applying “an inverse transform” to the results of the step mentioned above.

Sharma et al. do not *explicitly* disclose the limitation of applying so-called “envelope function” to the image signal in transform domain, yielding an result and further applying “an inverse transform” to the result.

However, **Murakami** discloses an invention relates to an image processing apparatus and method for embedding a digital watermark in a digital image and an image processing apparatus and method for extracting the embedded watermark from a digital image. More specifically, discloses the limitation of having “an envelope ring pattern generator” (*See Murakami, i.e. Figure 9, block 902*) for embedding an envelope ring pattern in a Fourier amplitude spectrum on basis of the Fourier amplitude generated by Fourier Transformer (*i.e. Figure 9, block 901*); An “Inverse Fourier Transformer” (*i.e. Figure 9, block 904*) is also disclosed for applying the “inverse Fourier Transform” to the previous results (*For details, column 8, line 47 – column 9, line 60*).

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to have modified **Sharma et al.** to include the limitation of applying so-called “envelope function” to the image signal in transform domain, yielding an result and further applying “an inverse transform” to the result taught by **Murakami**. It would have been obvious to

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one of ordinary skill in the art at the time of invention to have modified Sharma et al. by the teachings of Murakami to include the limitation of applying so-called “envelope function” to the image signal in transform domain, yielding an result and further applying “an inverse transform” to the result taught by Murakami, in order to obtain an image with digital watermark information embedded to be “imperceptible or nearly imperceptible to the human eye...” (See Murakami, i.e. column 9, lines 36-37).

With regard to claim 25, the claim is drawn to the method according to claim 20, wherein each of the watermark functions is formed by multiplying a sinusoid with an envelope function.

Sharma et al. do not *explicitly* disclose the limitation of applying a sinusoid with an envelope function.

However, Murakami discloses the limitation of “Hough transformation”, which utilizes a sine wave (see Murakami, i.e. column 6, lines 19-59; additionally, column 25, lines 57-65).

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to have modified Sharma et al. to include the limitation of applying a sinusoid with an envelope function taught by Murakami. It would have been obvious to one of ordinary skill in the art at the time of invention to have modified Sharma et al. by the teachings of Murakami to the limitation of applying a sinusoid with an envelope function taught by Murakami since “Hough transformation is known as one method that can obtain a figure, which can be expressed by parameters” (see Murakami, i.e. column 5, lines 50-52).

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20. **Claims 8 and 18** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sharma et al.** as applied to claims 1-7, 9-17, 19-22 and 25 above, and further in view of **Rhoads et al.** (**U.S. Pub. No. 2003/0215112**).

With regard to claims 8 and 18, the claims are drawn to the method according to claim 1 and claim 10 respectively, wherein the PIUE is part of a postal indicia.

Sharma et al. do not *explicitly* disclose the limitation of the original printed image being a postal indicia.

However, **Rhoads et al.** disclose the limitation of the original printed image being a postal indicia (*see Rhoads et al., i.e. Paragraph [0118]*).

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to have modified **Sharma et al.** to include the limitation of the original printed image being a postal indicia taught by **Rhoads et al.** It would have been obvious to one of ordinary skill in the art at the time of invention to have modified **Sharma et al.** by the teachings of **Rhoads et al.** to the limitation of the original printed image being a postal indicia taught by **Rhoads et al.** for *at least* the reasons of both prior arts of record are related and solving the problems in the identical field of arts, watermarking (or data hiding, data embedding, digital watermarking, steganography).

21. **Claims 23 and 24** are rejected under 35 U.S.C. 103(a) as being unpatentable over **Sharma et al.** as applied to claims 1-22 and 25 above, and further in view of **Manjunath et al.** (**U.S. Patent no. 6,332,030**).

With regard to claims 23 and 24, the claims are drawn to the method according to claim 20, and further requiring the limitations of the message bits are arrayed only at lattice points having indices that sum to an even (as in claim 23) and an odd (as in claim 24) numbers.

Sharma et al. do not *explicitly* disclose the limitations of the message bits are arrayed only at lattice points having indices that sum to an even (as in claim 23) and an odd (as in claim 24) numbers.

However, Manjunath et al. disclose an invention that provides “a robust data hiding techniques using channel codes derived from a finite subset of general n-dimensional lattices”. Specifically, the lattice which consists of all integer n-tuples with an even sum was disclosed to be utilized (*See Manjunath, i.e. column 3, lines 43-46*).

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to have modified Sharma et al. to include the limitations of the message bits are arrayed only at lattice points having indices that sum to an even (as in claim 23) and an odd (as in claim 24) numbers taught by Manjunath et al. It would have been obvious to one of ordinary skill in the art at the time of invention to have modified Sharma et al. by the teachings of Manjunath et al. to the limitations of the message bits are arrayed only at lattice points having indices that sum to an even (as in claim 23) and an odd (as in claim 24) numbers taught by Manjunath et al., in this approach, “a gray-scale image of as much as half the size of the host image can be embedded by perturbing the host wavelet coefficients” (*see Manjunath et al., column 3, lines 50-52*), which allowing the user to embed additional information.

Conclusion

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- A. Rhoads et al. (U.S. Pub. No. 2003/0053653) disclose a watermark system includes an embedder, detector and reader.
- B. Sharma et al. (U.S. Pub. No. 2003/0026453) disclose an invention relates to digital watermarking.
- C. Wendt (U.S. Pub. No. 2002/0126870) discloses a method of block-based watermarking by detecting the location of the watermark.
- D. Macy et al. (U.S. Patent No. 6,823,455) disclose a method for robust watermarking of content.
- E. Tsai et al. (U.S. Patent No. 6,993,151) disclose a watermark embedding and extracting method and embedding hardware structure used in image compression system.
- F. Echizen et al. (U.S. Patent No. 6,728,408) disclose a watermark embedding method and system, specifically detecting the position changes of the pixel in the content.
- G. Rhoads et al. (U.S. Patent No. 6,804,379) disclose a digital watermarks and postage.
- H. Lee et al. (U.S. Pub. No. 2004/0030899) disclose a method and an apparatus of inserting or detecting digital watermark.
- I. Nakamura et al. (U.S. Patent No. 6,185,312) disclose a method and an apparatus for embedding and reading watermarking-information in digital form, also discloses block-based implementation.

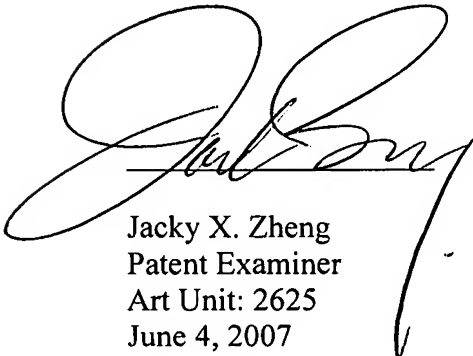
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J. Yoshiura et al. (U.S. Patent No. 6,711,276) discloses a control method and apparatus for embedding information data.

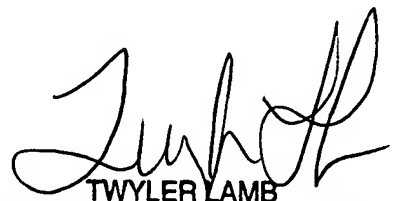
23. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jacky X. Zheng whose telephone number is (571) 270-1122. The examiner can *normally* be reached on Monday-Friday, 7:30 a.m.-5p.m., Alt. Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Twyler M. Lamb can be reached on (571) 272-7406. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



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